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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/849,371

05/20/2004

Go Muto

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09/15/2008

WESTERMAN, HATTORI, DANIELS & ADRIAN, LLP
1250 CONNECTICUT AVENUE, NW
SUITE 700
WASHINGTON, DC 20036

EXAMINER

SIDDIQUEE, MUHAMMAD S

ART UNIT

PAPER NUMBER

1795

MAIL DATE

DELIVERY MODE

09/15/2008

PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No. 10/849,371	Applicant(s) MUTO ET AL.	
	Examiner MUHAMMAD SIDDIQUEE	Art Unit 1795	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 05 June 2008.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-12 is/are pending in the application.
- 4a) Of the above claim(s) 8-12 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-7 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Election/Restrictions

1. Applicant's election without traverse of Species 1 in the reply filed on 6/5/2008 is acknowledged. Claims 1-7 are examined on the merits.

Response to Arguments

2. Applicant's arguments filed on 6/5/2008 have been fully considered but they are not persuasive. The applicants contend that the second passage identified by the examiner is wrong because the flow through the second passage must go exterior of the fuel cell. The examiner asserts that it was a typo in labeling the second passage as line 268. It is stated in the same paragraph of the office action that valve (234) is in the second passage. Therefore, flow through the second passage leads to the exterior of the fuel cell.

3. The applicants contend that the purge duration is different from time interval of the purge and purge duration is determined based on the output of the hydrogen sensor not based on the output of the current sensor. However, Barton teaches that microcontroller can determine purge duration based on the measured current [paragraph 0077-0079]. Barton also teaches that purge duration can be pulse purge or inter-purge duration. Inter-purge duration is time immediately following the completion of the purging of fuel cell stack, during which microcontroller will not open the purge valve [paragraph 0077, 0090] which is basically time interval of the purge.

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Claim Rejections - 35 USC § 103

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

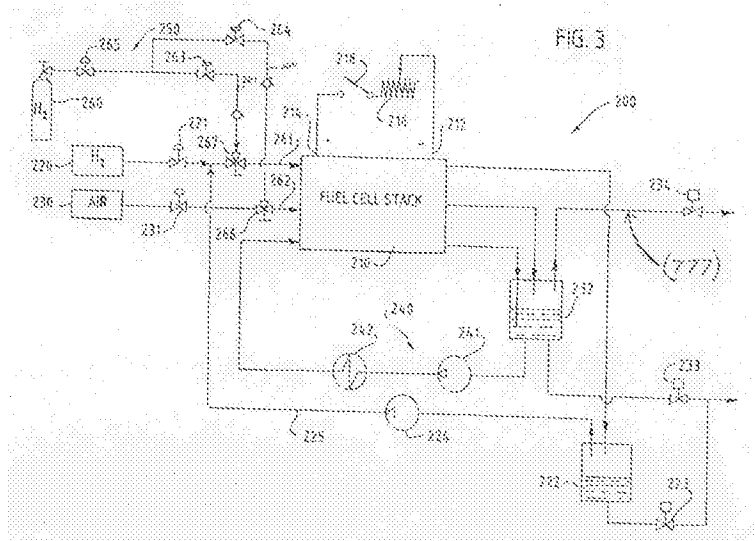
5. The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

6. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

7. Claims 1, 2, 4 and 7 are rejected under 35 U.S.C. 103(a) as being unpatentable over Roberts et al (US 2001/0055707 A1) in view of Barton et al (US 2003/0022041 A1).

Regarding claim 1 and 7, Roberts discloses a fuel cell system comprising more than one fuel cell and further comprising a conduit (269) (first passage) connecting the fuel cell stack to a purge gas (nitrogen) supply source (260); a conduit (777) (exhaust line) (second passage) connecting the fuel cell stack to exterior; a first valve (263) (first solenoid valve) installed in the first passage; a second valve (234) (second solenoid valve) installed in the second passage [Fig. 3; paragraph 0044, 0045]. Roberts does not show that the valves are solenoid valve but indicated that those can be control valves and can be controlled with a microcontroller. Roberts remain silent about current sensor. However, Barton discloses a fuel cell system comprising current sensor (S2) [paragraph 0052, 0077] producing an output indicative of current generated by the fuel cell stack, purge solenoid valve (70, CS4) [paragraph 50, 51] and a microcontroller (40) (electronic controller) [paragraph 0077, 0084, 0085]. Microcontroller (40) controls the purge solenoid valve (70, CS4) based on a time interval determined from the output of the current sensor (S2) [paragraph 0042, 0077]. Therefore, it would have been obvious to a person of ordinary skill in the art at the time the invention was made to incorporate solenoid valves in place of manual valves to control the valves with a controller; incorporate a current sensor and control the purge solenoid valves as taught by Barton in the fuel cell of Roberts in order to purge accumulated non-reactive components from the fuel cell stack and thereby efficient power generation.



Regarding claim 2, Barton teaches that the microcontroller (40) can be programmed to any predefined purge duration based on the input from the current sensor [paragraph 0078, 0079, 0082].

Regarding claim 4, Barton teaches a voltage sensor (S3) producing an output indicative of voltage generated by the fuel cell stack and the microcontroller (40) can purge the residue to the exterior when the voltage detected from the output of the voltage sensor falls below a threshold value [paragraph 0049, 0073, 00811].

8. Claim 3 is rejected under 35 U.S.C. 103(a) as being unpatentable over Roberts et al (US 2001/0055707 A1) in view of Barton et al (US 2003/0022041 A1) as applied in claim 1 and in further in view of Tsutomu et al (JP 2000-243417) (JP 2000-243417 is a foreign document and a machine translation is used).

Regarding claim 3, Roberts/Barton remains silent about a hydrogen sensor installed in the exhaust line (second passage). However, Tsutomu discloses a fuel cell

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system comprising a hydrogen concentration sensor (44) [paragraph 0026] installed in the exhaust line (12) to monitor hydrogen concentration for purging impurities from fuel cell [Drawing 1]. Therefore, it would have been obvious to a person of ordinary skill in the art at the time the invention was made to utilize the concept of hydrogen measurement in the exhaust line and controlling purge as taught by Tsutomu in the system of Roberts/Barton in order to detect hydrogen concentration in the exhaust line and control purging of the fuel cell stack and thereby efficient power generation.

9. Claims 5-6 are rejected under 35 U.S.C. 103(a) as being unpatentable over Roberts et al (US 2001/0055707 A1) in view of Barton et al (US 2003/0022041 A1) as applied in claim 4 and further in view of Nonobe (US 2002/0192520 A1).

Regarding claim 5, Roberts/Barton teaches to use a voltage threshold value to control purge [paragraph 0081]. However, Roberts/Barton remains silent about how to determine threshold value. Nonobe teaches that voltage threshold value is calculated from current sensor to control fuel cell system because the output current is related with the condition of the fuel cell [paragraph 0005]. Therefore, it would have been obvious to a person of ordinary skill in the art at the time the invention was made to utilize the concept of determining voltage threshold value from current output as taught by Nonobe in the system of Roberts/Barton in order to control purge and thereby efficient power generation.

Regarding claim 6, Barton teaches that the microcontroller (40) can be programmed to any predefined purge duration based on the input from the current sensor [paragraph 0078, 0079, 0082].

Conclusion

10. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to MUHAMMAD SIDDIQUEE whose telephone number is (571) 270-3719. The examiner can normally be reached on Monday-Thursday, 7:30 am to 4:00 pm EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Patrick Ryan can be reached on 571-272-1292. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

MSS

/PATRICK RYAN/
Supervisory Patent Examiner, Art Unit 1795